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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,732

10/03/2005

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4329

270 7590 12/27/2007
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EXAMINER

FOGARTY, CAITLIN ANNE

ART UNIT

PAPER NUMBER

4116

MAIL DATE

DELIVERY MODE

12/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,732	Applicant(s) ODA ET AL.	
	Examiner CAITLIN FOGARTY	Art Unit 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,7,8, and 13-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,7,8 and 13-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/5/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. Claims 1 – 3, 7 – 8, and 13 – 27 are pending and presented for the examination. Claims 4 – 6 and 9 – 12 have been canceled.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on April 1, 2003. It is noted, however, that applicant has not filed a certified copy of the JP 2003-97659 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

3. The information disclosure statement (IDS) was submitted on February 5, 2007. This submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. Please refer to applicant's copy of form PTO-1449 submitted herewith.

Claim Objections

4. Claim 17 is objected to because of the following informalities: “to **from** a target shape” should state “to **form** a target shape.” Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 8 and 21 – 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang (US 6,193,821 B1).

In regards to claim 8, col. 3 line 53 – col. 4 line 35 of Zhang teach a method of manufacturing a tantalum sputtering target comprising the steps of subjecting a molten and cast tantalum billet to forging, annealing, and rolling, performing a plastic working process on the billet, and thereafter annealing the billet at a temperature of 1173 K or less. Since Zhang teaches that the last annealing step occurs at a temperature of about 1173 to about 1473 K then the annealing step may occur at a temperature below 1173 K as recited in claim 8.

Regarding claim 21, which is dependent on claim 8, col. 4 lines 25 – 28 of Zhang disclose that after the step of annealing at a temperature of about 1173 K to about 1473 K (which as discussed above means the annealing step may occur at a temperature below 1173 K), the billet is machined (subjected to finish processing) to form the sputter target shape.

In regards to claim 22, which is dependent on claim 21, and claim 25, which is dependent on claim 8, col. 3 line 63 to col. 4 line 20 of Zhang teaches that the forging and annealing processes are repeated two or more times. Although Zhang does not

specifically state that the annealing step is recrystallization annealing, it occurs at a temperature range of 1173 – 1473 K which lies within the temperature range of 1173 – 1673 K recited in the specification of the instant application. Therefore, recrystallization must occur in the annealing steps disclosed by Zhang.

Regarding claim 23, which is dependent on claim 22, and claim 26, which is dependent on claim 8, col. 3 line 63 to col. 4 line 19 of Zhang teaches that side-forging (occurs at room temperature like extend forging) and upset forging are repeatedly performed on the billet.

In regards to claim 24, which is dependent on claim 23, and claim 27, which is dependent on claim 8, col. 3 line 63 to col. 4 line 20 of Zhang disclose the annealing step occurs at a temperature range of 1173 – 1473 K which overlaps with the temperature range recited in claims 24 and 27 of a temperature of between a recrystallization temperature of the billet and 1673 K. Therefore, recrystallization must occur in the annealing steps disclosed by Zhang.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1 – 3, 7, and 13 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,193,821 B1) in view of Pircher et al. (US 4,994,118).

In regards to claim 1, col. 3 line 53 – col. 4 line 35 of Zhang disclose a tantalum sputtering target manufactured by subjecting a molten and cast tantalum billet to forging, annealing, and rolling. Zhang differs from claim 1 in that Zhang does not disclose that the tantalum sputtering target has a non-recrystallized structure.

It would have been obvious to one of ordinary skill in the art to modify Zhang in view of Pircher et al. because in col. 1 line 59 to col. 2 line 6, Pircher et al. disclose the

method of performing finish rolling on a metal or metal alloy in the non-recrystallization range. One would have been motivated to modify Zhang in view of Pircher et al. because it is well known in the art that performing the finishing steps on a metal or metal alloy in the non-recrystallization range results in a higher mechanical strength of the final product. Additionally, claim 1 is a product-by-process claim and therefore the process limitations of the claim do not have patentable weight, only the structural limitations have weight. See MPEP 2113.

Regarding claims 2 and 3, which are dependent on claim 1, Zhang in view of Pircher et al. discloses the limitations of claim 1 as discussed above. Zhang in view of Pircher et al. differs from claims 2 and 3 because they do not disclose that the non-recrystallized structure of the tantalum sputtering target is either 20% or more or 40% or more. However, since Zhang in view of Pircher et al. teaches the limitations of claim 1, it would have been inherent that the tantalum sputtering target would have a non-recrystallized structure of 20% or more or 40% or more since it is made by the method recited in claim 1. See MPEP 2112.

In regards to claim 13, which is dependent on claim 3, and claims 14 – 16, which are dependent on claim 1, Zhang in view of Pircher et al. discloses the limitations of claims 1 and 3 as disclosed above. Zhang in view of Pircher et al. differs from claims 13 – 16 because they do not disclose the Vickers hardness of the tantalum sputtering target. However, the Vickers hardness values recited in claims 13 – 16 would have been inherent in the tantalum sputtering target because the target was made by the method recited in claim 1. See MPEP 2112.

Regarding claim 7, col. 3 line 53 – col. 4 line 35 of Zhang teach a process for manufacturing a tantalum sputtering target comprising the steps of subjecting a molten and cast tantalum billet to forging, annealing and rolling processes. Zhang differs from claim 7 in that Zhang does not disclose the step of performing plastic working on the billet to provide the tantalum sputtering target with a non-recrystallized structure.

However, as discussed above, it would have been obvious to one of ordinary skill in the art to modify Zhang in view of Pircher et al. because in col. 1 line 59 to col. 2 line 6, Pircher et al. disclose the method of performing finish rolling on a metal or metal alloy in the non-recrystallization range. One would have been motivated to modify Zhang in view of Pircher et al. because it is well known in the art that performing the finishing steps on a metal or metal alloy in the non-recrystallization range results in a higher mechanical strength of the final product.

In regards to claims 17 – 20, which are dependent on claim 7, Zhang in view of Pircher et al. teaches the limitations of claim 7 as discussed above.

The limitations of claim 17 are taught in col. 4 lines 25 – 28 of Zhang. Zhang discloses that after plastic working the billet is machined (subjected to finish processing) to form the sputter target shape. The limitations of claims 18 and 20 are taught in col. 3 line 63 to col. 4 line 20 where Zhang teaches that the forging and annealing processes are repeated two or more times. Although Zhang does not specifically state that the annealing step is recrystallization annealing, it occurs at a temperature range of 1173 – 1473 K which is within the temperature range of 1173 – 1673 K recited in the specification of the instant application. Claim 20 recites that the recrystallization step

occurs at a temperature of between a recrystallization temperature of the billet and 1673 K which still overlaps with the temperature range taught in Zhang. Therefore, recrystallization must occur in the annealing steps disclosed by Zhang. In col. 3 line 63 to col. 4 line 19, Zhang teaches the limitations of claim 19 by stating that side-forging (occurs at room temperature like extend forging) and upset forging are repeatedly performed on the billet.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1, 7 and 8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2 and 11 – 12 of copending Application No. 10/532,473. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method disclosed in Application No. 10/532,473 overlaps in scope with that of the instant application. The methods in each application recite a method of manufacturing a tantalum sputtering target in which a tantalum ingot or billet formed by melting and casting is subject to forging, annealing, and rolling processing.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

13. No claim is allowed. All pending claims have been rejected.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CF

/Vickie Kim/
Supervisory Patent Examiner, Art Unit 4116